Washington State GIT Enterprise Architecture Initiative

Overview for the WaTrans Steering Committee

April 24, 2006

What is the GIT Enterprise Architecture Initiative?

A <u>decision making framework</u> for identifying the GIT components that <u>state agencies</u> want to manage and fund as state <u>enterprise assets</u>. The GIT EA is a domain of the Information Services Board EA Program.

Initiated February 2005

Conceptual Design approved by Information Services Board January 2006

Who is Involved?

- Washington State Information Services Board
- Washington State Enterprise Architecture Committee
- Washington State Geographic Information Technology Committee
- Washington State GIT Agencies
- Department of Information Systems

Scope

Tier 1 – *Business processes, data, or technologies that are common for the state*

Attributes:

- Agencies could derive greater value by using a common approach.

- The benefits outweigh the cost of creating commonality across agencies.

- Not being common will create a weak link that jeopardizes effectiveness for other agencies.

- Facilitates a single enterprise view of the state for the citizens, employees, and business partners.

- Needed to best support statewide processes that create economies of scale and/or operating efficiencies, and consistent/quality information.

Components

- **<u>Information Architecture</u>** aligns business processes to information systems that support them
- **<u>Business Architecture</u>** is a high-level representation of the vision, mission, goals, objectives and business strategies that comprise the strategic business intent of Washington state government
- **<u>Solution Architecture</u>** facilitates and describes the definition of architectural enterprise solutions (business, infrastructure, and application solutions)
- **<u>Technology Architecture</u>** is a disciplined approach for documenting the enterprise's current and emerging technologies in the form of policies, standards, and guidelines

  (The description of each sub-architecture above is adopted from the **<u>NASCIO</u>** Enterprise Architecture Tool-Kit, version 3.0.)

Washington State Geographic Information Strategic Plan

http://wagic.wa.gov/plan04/draft_final_092104.pdf

Strategy 1

Develop a common vision and architecture for GIT deployment across state agencies with a long-term goal of linking to federal and local architectures..

Objective 1a

Develop an Enterprise Architecture that meets shared GIT needs.

Objective 1b:

Identify an optimal role for the state as the catalyst that coordinates GIT needs across government jurisdictions and identify the best organizational and operational structure to meet those needs.

Work together with the Information Services Board (ISB) Enterprise Architecture process to develop GIT governance and decision-making mechanisms that facilitate <u>interagency collaboration</u>. Take advantage of this collaborative environment to position the <u>state GIT enterprise as a desirable and beneficial partner for federal, local and tribal jurisdictions.</u> The <u>EA process</u> will examine and determine the appropriate role for the state GIT enterprise in relation to its federal, local and tribal partners.

Strategy 2

Leverage GIT investments through enhanced access to data and applications..

Objective 2a:

 Produce multi-use geographic data through partnerships. Integrate Washington Geospatial Framework Data Activities with the Washington GIT Enterprise Architecture.

 This objective seeks to leverage the state's investment in the National Spatial Data Initiative (NSDI) Framework Data themes by incorporating these activities into the GIT strategic vision. Ready access to framework data is the most important element in the provision of current data and information to policy makers.
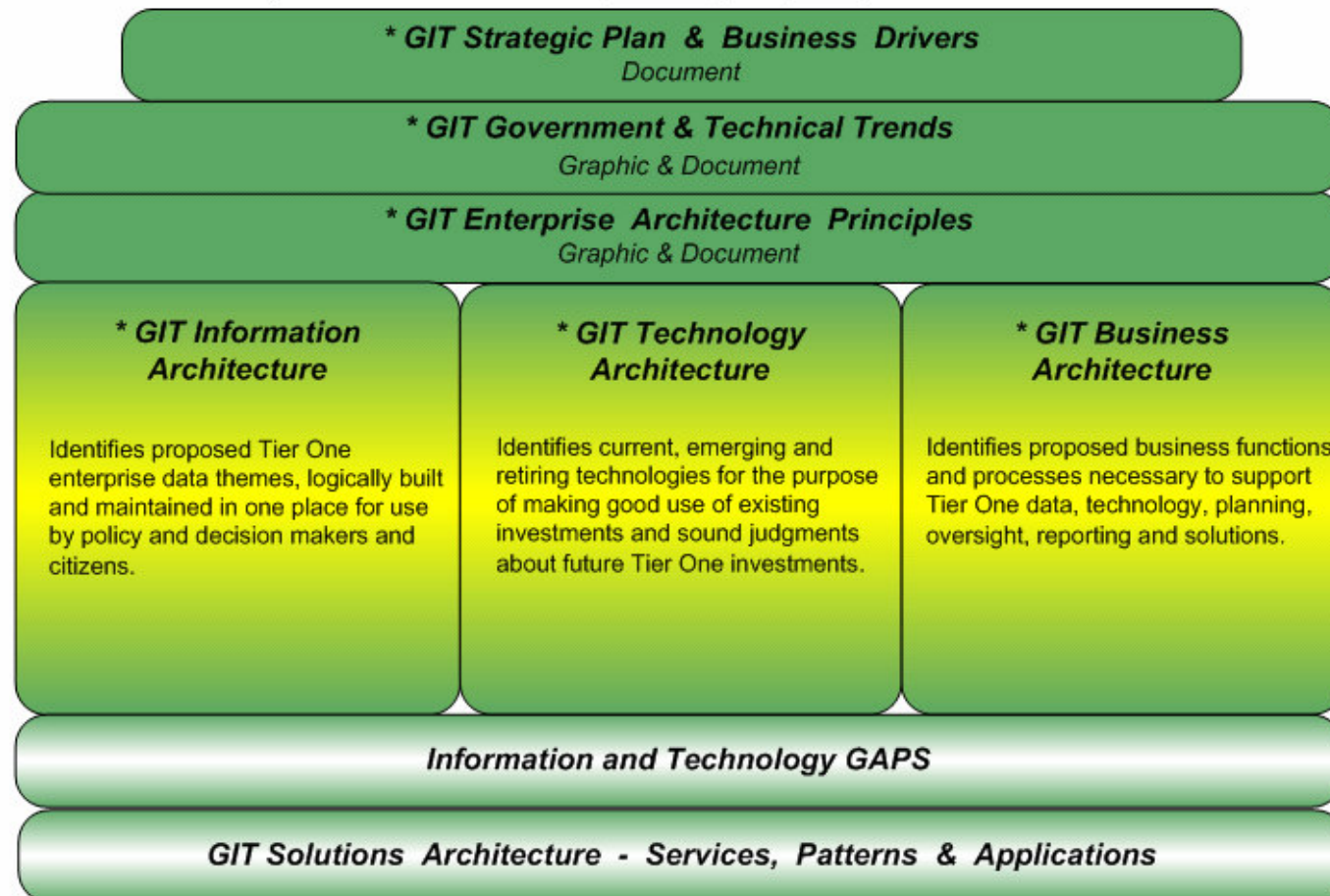
Strategy Three

Integrate state GIT activities with federal and local interests and needs through enhanced collaboration and initiatives that cross jurisdictions..

WA GIT Enterprise Architecture Framework

Draft – December 2005

Conceptual Architecture Overview: <u>Summary</u>   <u>Detail</u>

* GIT Strategic Plan & Business Drivers
Document

* GIT Government & Technical Trends
Graphic & Document

* GIT Enterprise Architecture Principles
Graphic & Document

* GIT Information Architecture	*** GIT Technology Architecture**	*** GIT Business Architecture**
Identifies proposed Tier One enterprise data themes, logically built and maintained in one place for use by policy and decision makers and citizens.	Identifies current, emerging and retiring technologies for the purpose of making good use of existing investments and sound judgments about future Tier One investments.	Identifies proposed business functions and processes necessary to support Tier One data, technology, planning, oversight, reporting and solutions.

Information and Technology GAPS

GIT Solutions Architecture - Services, Patterns & Applications

Government and Technology Trends

- Government Management Accountability & Performance (GMAP)
- Priorities of Government (POG) Budgeting Process
- Citizen Focused – Internet access to government services and information
- Convergence of GIT and IT
- Data and Application access through Web Services
- Integration of State Data Holdings
- Rapidly Changing Technology

GIT Enterprise Architecture Principles

- Spatial Information and Data Is a Valued Investment and Asset

- Spatial Data and Information Stewardship

- Total Cost of Ownership

- Mainstream Technologies and Industry Standards

- GIT <u>Framework Data</u> as Primary Source

GIT Information Architecture

Leverages work that state agencies have accomplished addressing their National Spatial Data Infrastructure (NSDI) Framework data needs.

- geospatial data themes
    - Orthoimagery
    - Hydrography
    - Transportation
    - Cadastre
    - Government Units
    - Geodetic Control
    - Elevation

GIT Technology Architecture

Identifies current, emerging and retiring technologies for the purpose of making good use of existing investments and sound judgments about future investments.

Categorizes components as Research, Emerging, Limited, Preferred, Sunset, and Obsolete

Emphasis on ESRI, MicroSoft and Open Geopatial Consortium standards as 'Preferred' technologies

GIT Technology Architecture - Example

Spatial Data Communications Technology

Data Exchange Language	Baseline (June '05)		Tactical (18 to 24 months out)		Strategic (25 to 36 months out)	
	Desktop	Server	Desktop	Server	Desktop	Server
XML - Extensible Markup Language is a standard meta-language for creating markup languages that describe the structure of data.	preferred		preferred		preferred	
GML - Geography Markup Language takes advantage of XML's flexibility. GML is simply a standard way of encoding geospatial data in XML, based on the OpenGIS standards for representation of geospatial features.	emerging		limited		limited	

Data Exchange Formats	Baseline		Tactical		Strategic (25	
	Desktop	Server	Desktop	Server	Desktop	Server
SDTS - The Spatial Data Transfer Standard is a US Federal Information Processing Standard (FIPS173) specifying the organization and mechanism for the transfer of GIS data between dissimilar computer systems.	limited		sunset		sunset	
Arc Export - EXPORT creates an ARC/INFO interchange file to transfer coverages, INFO data files, text files and other ARC/INFO files between various computer systems.	preferred		sunset		obsolete	
Arc Shape File - A format for vector data to be used in geographic information systems produced by ESRI.	preferred		sunset		obsolete	
Arc Personal GeoDatabase - An ESRI data storage format. A geodatabase represents geographic features and attributes as objects that are hosted inside a relational database management system. (Arc Personal GeoDatabase is the single user desktop implementation of ArcGeoDatabase).	limited		preferred		preferred	
ArcSDE Import/Export - An ESRI server based data exchange format and process.		preferred		preferred		preferred

GIT Business Architecture

- describes the business functions and processes needed to support the GIT enterprise architecture.

- 5 Functional areas, 23 business processes

- processes are described and characterized by:
  Triggers – event(s) that initiate process
  Inputs – primary information used to produce process outcomes
  Outcomes – outcomes of process
  Steps – sequence of process tasks that use inputs to produce outcomes

- GIT EA roles and stakeholder responsibilities for each of the business processes are proposed.

GIT Business Architecture – Example
Tier1 Data Management Function

GIT EA T1 Business Process	Process Roles & Stakeholders	Process Description	
A. **Identify and Vet Spatial Data Stewards** - Identify data stewards and their responsibilities	• Executive Approval – ISB/GIT* • Advisor – SME (WAGIC, FMG)* • Process Manager – Program Office* • Reviewer – GIT Community* • Initiator – ISB/GIT	T – Tier 1 data theme needs steward I – Willing agency(s) with aligned mission I – Stakeholder preferences O – Agency and COI agreement to support role	S1. Identify T1 data themes S2. Propose steward responsibilities S3. Identify potential steward(s) S4. Vet stewards willingness S5. Vet with stakeholders S6. Obtain funding (see Funding Process description) S7. Formalize agreement

Information and Technology Gaps

- The lack of shareable or common data infrastructure leads to <u>information islands</u> and results in duplicated data investment and management efforts

- The lack of well documented, comprehensive, current data <u>inhibits the identification of policy options</u> and effective support of executive decision processes.

- Local, federal and tribal organizations have <u>difficulty partnering with Washington state agencies</u> when agencies act as individual organizations rather than as a collaborative GIT enterprise.

- <u>Current governance</u> and coordination mechanisms, helpful in the past, are <u>not sufficient</u> to guide the operation of a statewide enterprise application of this technology

- <u>State agencies struggle</u> with the implementation of <u>newer GIT technologies</u> while continuing to support customers and existing systems.

Solutions Architecture

- **Enterprise GIT Clearinghouse and Portal**
  - a logically centralized web-based point of discovery and access to fundamental spatial data and applications.

- **Enterprise GIT Shared Infrastructure**
  - an integrated collection of storage, transport and processing platforms available for use at agencies' discretion to meet their spatial information management needs.

- **Enterprise GIT Program Office**
  - budgeted GIT EA support function that is focused on enabling the key enterprise business processes, governance structures and infrastructure necessary for successful implementation and continued operation of the GIT Enterprise Architecture.

Implementation Strategy
Enterprise Planned, Project Implemented

Phase II

Develop logical and physical design for:

– GIT Portal and Operational support systems

Objectives

- Design a <u>logically</u> centralized web-based portal for discovery and access to fundamental spatial data and applications
- Define operational support function that enables key enterprise business processes, governance structures and funding necessary for successful implementation and continued operation of the GIT Portal

Phase II Timeline

- Phase 2 Charter approved by ISB/GIT March 2006
- Requirements, Logical and Physical Design June 2006
- Decision Package Development July 2006
- Deployment/Implementation Planning September 2006

GIT EA Phases III & IV

Phase III: Framework data governance, standards and protocols : October 2006 – March 2007

- Reconstitute Framework Management Group per GIT EA Business Processes
- Identify Portal datasets and applications
- Set policy and web service protocols
- Seek endorsements and ISB approval

Phase IV: Begin GIT Portal Implementation – June 2007

Relationship to WATRANS

- WaTrans as a candidate state framework layer could 'Pioneer':
  - Business Architecture Processes
    - Designation as a Framework dataset
    - Stewardship
    - Change Management
    - Sensitive and Secure Data Management
    - Tier 1 Dataset Coincident Geometry Registration
    - Updates and Enhancments
    - Data Sharing Agreements
    - Enterprise Funding Process

  - Technology Architecture
    - Data Communications
    - Data Exchange Formats
    - Access and Distribution
    - GIS Software

  - Support from reconstituted Framework Management Group

- Distribution through State Portal

More Information

- GIT EA Web Page:
  http://wagic.wa.gov/GITEA/gitindex3.htm

- Information Services Board EA Web Page:
  http://isb.wa.gov/committees/enterprise/index.aspx

- State GIT Strategic Plan:
  http://wagic.wa.gov/plan03/2003_plan_update3.htm